

WE CLAIM:

1 1. A digital image system, comprising:
2 a digital image sensor including at least an array of photo-detectors having one
3 or more repeat units therein, each said repeat unit including at least one single-color photo-
4 detector capable of detecting a luminance value and a two-color photo-detector capable of
5 detecting first and second chrominance values; and
6 interpolation logic connected to receive said detected luminance value and
7 interpolate at least one interpolated luminance value associated with said two-color photo-
8 detector, said interpolation logic being further connected to output said detected luminance
9 value without interpolating said first or second chrominance value associated with said
10 detected luminance value.

1 2. The system of Claim 1, wherein said luminance value is associated with the
2 intensity of light within a first range of wavelengths, said first chrominance value is associated
3 with the intensity of light within a second range of wavelengths and said third chrominance
4 value is associated with the intensity of light within a third range of wavelengths.

3. The system of Claim 2, further comprising:

output logic connected to receive said detected luminance value, said detected first and second chrominance values and said interpolated luminance value and output at least one group of color values including four output luminance values, one first output chrominance value and one second output chrominance value, at least one of said four output luminance values being derived from said detected luminance value or said interpolated luminance value, said first output chrominance value being derived from said first chrominance value and said second output chrominance value being derived from said second chrominance value.

4. The system of Claim 3, wherein said interpolation logic and said output logic are included within said digital image sensor.

5. The system of Claim 3, wherein said four output luminance values, said first output chrominance value and said second output chrominance value are directly compressed with no additional processing.

6. The system of Claim 3, further comprising:

chrominance processing logic connected to receive said detected first and second chrominance values and produce said first output chrominance value and said second output chrominance value.

7. The system of Claim 6, wherein said chrominance processing logic is capable of

subtracting said interpolated luminance value from said first chrominance value to produce said first output chrominance value.

8. The system of Claim 6, wherein said chrominance processing logic is further

connected to receive additional detected first and second chrominance values, said chrominance processing logic averaging said detected first chrominance value and said additional detected first chrominance value to produce said first output chrominance value and averaging said detected second chrominance value with said additional detected second chrominance value to produce said second output chrominance value.

9. The system of Claim 3, wherein said single-color photo-detector for said repeat

unit comprises a first single-color photo-detector capable of detecting a first luminance value and a second single-color photo-detector capable of detecting a second luminance value.

10. The system of Claim 9, wherein said at least one interpolated luminance value comprises a single interpolated luminance value associated with said two-color photo-detector.

11. The system of Claim 9, wherein said at least one interpolated luminance value comprises first and second interpolated luminance values associated with said two-color photo-detector.

12. The system of Claim 11, wherein said four output luminance values are derived from said first and second interpolated luminance values and said first and second detected luminance values.

13. The system of Claim 3, wherein said single-color photo-detector for said repeat unit comprises a first single-color photo-detector capable of detecting a first luminance value, a second single-color photo-detector capable of detecting a second luminance value and a third single-color photo-detector capable of detecting a third luminance value.

14. The system of Claim 13, wherein said four output luminance values are derived from said first, second and third detected luminance values and said interpolated luminance value.

1 15. A digital image system, comprising:
2 a digital image sensor including at least an array of photo-detectors having one
3 or more repeat units therein, each said repeat unit including at least one single-color photo-
4 detector capable of detecting a luminance value and a two-color photo-detector capable of
5 detecting first and second chrominance values; and
6 interpolation logic connected to receive said detected luminance value and
7 interpolate at least one interpolated luminance value associated with said two-color photo-
8 detector, said interpolation logic being further connected to assign said first and second
9 chrominance values to said detected luminance value and output said detected luminance value
10 and said first and second chrominance values.

1 16. The system of Claim 15, wherein said luminance value is associated with the
2 intensity of light within a first range of wavelengths, said first chrominance value is associated
3 with the intensity of light within a second range of wavelengths and said third chrominance
4 value is associated with the intensity of light within a third range of wavelengths.

17. The system of Claim 16, further comprising:

output logic connected to receive said detected luminance value, said detected
first and second different chrominance values and said interpolated luminance value and output
at least one group of color values including four output luminance values, one first output
chrominance value and one second output chrominance value, at least one of said four output
luminance values being derived from said detected luminance value or said interpolated
luminance value, said first output chrominance value being derived from said first chrominance
value and said second output chrominance value being derived from said second chrominance
value.

18. The system of Claim 17, wherein said interpolation logic and said output logic
are included within said digital image sensor.

19. The system of Claim 3, wherein said four output luminance values, said first
output chrominance value and said second output chrominance value are directly compressed
with no additional processing.

1 20. The system of Claim 17, further comprising:

2 chrominance processing logic connected to receive said detected first and
3 second chrominance values and produce said first output chrominance value and said second
4 output chrominance value.

1 21. The system of Claim 20, wherein said chrominance processing logic is capable
2 of subtracting said interpolated luminance value from said first chrominance value to produce
3 said first output chrominance value.

1 22. The system of Claim 20, wherein said chrominance processing logic is further
2 connected to receive additional detected first and second chrominance values, said
3 chrominance processing logic averaging said detected first chrominance value and said
4 additional detected first chrominance value to produce said first output chrominance value and
5 averaging said detected second chrominance value with said additional detected second
6 chrominance value to produce said second output chrominance value.

1 23. A method for processing raw digital color image values, comprising:
2 providing an array of photo-detectors on a digital image sensor, said array of
3 photo-detectors having one or more repeat units therein, each said repeat unit including at
4 least one single-color photo-detector capable of detecting a luminance value and a two-color
5 photo-detector capable of detecting first and second chrominance values;
6 interpolating at least one interpolated luminance value associated with said
7 two-color photo-detector, and
8 processing said detected luminance value without interpolating said first or
9 second chrominance value associated with said detected luminance value.

1 24. The method of Claim 23, further comprising:
2 outputting at least one group of color values including four output luminance
3 values, one first output chrominance value and one second output chrominance value, at least
4 one of said four output luminance values being derived from said detected luminance value or
5 said interpolated luminance value, said first output chrominance value being derived from said
6 first chrominance value and said second output chrominance value being derived from said
7 second chrominance value.

1 25. The method of Claim 24, further comprising:

2 compressing said four output luminance values, said first output chrominance
3 value and said second output chrominance value directly with no additional processing.

1 26. The method of Claim 24, further comprising:

2 subtracting said interpolated luminance value from said detected first
3 chrominance value to produce said first output chrominance value.

1 27. The method of Claim 23, further comprising:

2 detecting additional first and second chrominance values;
3 averaging said detected first chrominance value and said detected additional
4 first chrominance value to produce said first output chrominance value; and
5 averaging said detected second chrominance value with said detected additional
6 second chrominance value to produce said second output chrominance value.